

What is claimed is:

1. A fluorescence imaging apparatus, comprising:

i) excitation light irradiating means for
irradiating excitation light to a measuring site, the
excitation light causing the measuring site to produce
fluorescence,

ii) imaging means for imaging the fluorescence,
which has been produced from the measuring site when the
excitation light is irradiated to the measuring site, and

iii) imaging control means for controlling
operations of the imaging means,

wherein the imaging means is provided with an image
sensor, which comprises a plurality of pixels arrayed in
two-dimensional directions and which has a fluorescence
imaging region utilized for the imaging of the fluorescence
and a non-imaging region other than the fluorescence imaging
region, and

the imaging control means controls such that, when
signal charges are to be read from the image sensor, signal
charges, which have been accumulated in at least certain
pixels among pixels falling within the non-imaging region,
are read with a quick reading operation, in which the signal
charges are read at a reading speed higher than the reading
speed for the fluorescence imaging region.

2. A fluorescence imaging apparatus, comprising:

i) excitation light irradiating means for

irradiating excitation light to a measuring site, the excitation light causing the measuring site to produce fluorescence,

5 ii) imaging means for imaging the fluorescence, which has been produced from the measuring site when the excitation light is irradiated to the measuring site, and

iii) imaging control means for controlling operations of the imaging means,

10 wherein the imaging means is provided with an image sensor, which comprises a plurality of pixels arrayed in two-dimensional directions and which has a fluorescence imaging region utilized for the imaging of the fluorescence and a non-imaging region other than the fluorescence imaging region, and

15 the imaging control means controls such that, when signal charges are to be read from the image sensor, signal charges, which have been accumulated in at least certain pixels among pixels falling within the non-imaging region, are read with a binning reading operation, in which the signal
20 charges having been accumulated in a plurality of the pixels are added together, and a total sum signal charge having been obtained from the addition is read.

3. A fluorescence imaging apparatus, comprising:

25 i) excitation light irradiating means for irradiating excitation light to a measuring site, the excitation light causing the measuring site to produce

fluorescence,

ii) imaging means for imaging the fluorescence, which has been produced from the measuring site when the excitation light is irradiated to the measuring site, and

5 iii) imaging control means for controlling operations of the imaging means,

wherein the imaging means is provided with an image sensor, which comprises a plurality of pixels arrayed in two-dimensional directions and which has a fluorescence imaging region utilized for the imaging of the fluorescence and a non-imaging region other than the fluorescence imaging region, and

the imaging control means controls such that, when signal charges are to be read from the image sensor, signal charges, which have been accumulated in at least certain pixels among pixels falling within the non-imaging region, are prevented from being read.

4. A fluorescence imaging apparatus, comprising:

20 i) excitation light irradiating means for irradiating excitation light to a measuring site, the excitation light causing the measuring site to produce fluorescence,

25 ii) imaging means for imaging the fluorescence, which has been produced from the measuring site when the excitation light is irradiated to the measuring site, and

iii) imaging control means for controlling

operations of the imaging means,

wherein the imaging means is provided with a charge transfer type of image sensor, which comprises a plurality of pixels arrayed in two-dimensional directions and which has a fluorescence imaging region utilized for the imaging of the fluorescence and a non-imaging region other than the fluorescence imaging region, and

the imaging control means controls such that, when signal charges are to be read from the image sensor, signal charges, which have been accumulated in pixels falling within a certain area of the non-imaging region, are read with either one of a quick reading operation, in which the signal charges are read at a reading speed higher than the reading speed for the fluorescence imaging region, and a binning reading operation, in which the signal charges having been accumulated in a plurality of the pixels are added together, and a total sum signal charge having been obtained from the addition is read, and signal charges, which have been accumulated in pixels falling within the other area of the non-imaging region, are prevented from being read.

5. An apparatus as defined in Claim 3 or 4 wherein the image sensor is provided with a clearing section for clearing signal charges, which have been accumulated in pixels.

6. An apparatus as defined in Claim 3 or 4 wherein the image sensor is provided with horizontal shifting means,

from which the signal charges are read in one direction,

the imaging control means controls such that the signal charges having been accumulated in the pixels are transferred to the horizontal shifting means and are then read from the horizontal shifting means, and

the fluorescence imaging region is located at a position shifted from a center position on an imaging surface of the image sensor toward a side corresponding to a read-out side of the horizontal shifting means.

7. An apparatus as defined in Claim 5 wherein the image sensor is provided with horizontal shifting means, from which the signal charges are read in one direction,

the imaging control means controls such that the signal charges having been accumulated in the pixels are transferred to the horizontal shifting means and are then read from the horizontal shifting means, and

the fluorescence imaging region is located at a position shifted from a center position on an imaging surface of the image sensor toward a side corresponding to a read-out side of the horizontal shifting means.

8. A fluorescence imaging apparatus, comprising:

i) excitation light irradiating means for irradiating excitation light to a measuring site, the excitation light causing the measuring site to produce fluorescence,

ii) imaging means for imaging the fluorescence,

which has been produced from the measuring site when the excitation light is irradiated to the measuring site, and

iii) imaging control means for controlling operations of the imaging means,

5 wherein the imaging means is provided with a random access type of image sensor, which comprises a plurality of pixels arrayed in two-dimensional directions and which has a fluorescence imaging region utilized for the imaging of the fluorescence and a non-imaging region other than the fluorescence imaging region, and

the imaging control means controls such that, when signal charges are to be read from the image sensor, only the signal charges, which have been accumulated in pixels falling within the fluorescence imaging region, are read.